IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Applicant | : Carl de Marcken et al. | Art Unit | : 3628 |
| Serial No. | : 10/714,525 | Examiner | : Daniel Vetter |
| Filed | : November 14, 2003 | Conf. No. | : 2223 |
| Title | : GENERATING FLIGHT SCHEDULES USING FARE ROUTINGS AND RULES | | |

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Alexandria, VA 22313-1450

### APPEAL BRIEF ON BEHALF OF CARL DE MARCKEN ET AL.

The Appeal Brief fee of $540 and the fee of $490 for the Petition for Extension of Time are being paid concurrently via the EFS by way of deposit account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

**(1)    Real Party in Interest**

The real party in interest is ITA Software, 141 Portland Street, Cambridge, MA.

**(2)    Related Appeals and Interferences**

The appellant is not aware of any appeals or interferences related to the above-identified

patent application.

**(3)    Status of Claims**

This is an appeal from the decision of the Primary Examiner in an office action dated

**November 6, 2009,** finally rejecting claims 21-76 all of the claims remaining under

consideration in the application.  Claims 1-20 were previously withdrawn from consideration.

Appellant filed a Notice of Appeal on February 24, 2010. Claims 21-76 are the subject of this

appeal.

**(4)    Status of Amendments**

All previously filed amendments have been entered.

**(5)    Summary of Claimed Subject Matter**

Claim 21

Appellant's claim 21 is directed to a computer program product residing on a computer

readable medium for producing itineraries: *"According to a further aspect of the present*

*invention, a computer program product residing on a computer readable medium for producing*

*itineraries includes...."* [1]

Inventive features of Appellant's claim 21 include instructions to receive trip segments:

*"A general process 50 for a flight scheduler 18 in the TPS 10 includes receiving 52 trip*

*segments."* [2]

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[1] Appellant's Specification, page 2, lines 27-29.
[2] *Id.*, page 8, lines 4-5.

Inventive features also include instructions to determine constraints on sequences of flights between the endpoints of the trip segments, *"the process 100 uses the routing to generate 106 restrictions on individual flight and runs 107 the flight scheduler incorporating flight restrictions to generate flight combinations that satisfy query time and origin and destination constraints."* [3] The constraints are derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments: *"For example, a Los Angeles to London (LAX-LON) fare may be given the global indicator AT, meaning "Atlantic", restricting routes to travel over the Atlantic Ocean. ... the AT global indicator requires a flight across the Atlantic ocean and prohibits flights across the Pacific ocean, thus ensuring for a LAX-LON fare that one does not fly LAX-SYD-PAR-LON."* [4]

Inventive features further include instructions to generate itineraries of sequences of flights using the constraints to select which flights to include in the sequences of flights of the generated itineraries, *"For each fare in F with unique routing and endpoints, as per figure 2, the process generates 214 scheduler restrictions from fare, augments 216 scheduler restrictions to allow for any necessary additional flights between endpoints of fare and trip endpoints, such as flight from x to x' or from y' to y, and generates 218 itineraries using flight scheduler constrained by restrictions."* [5]

Inventive features further include instructions to price the itineraries *"This reduction may make it possible for an itinerary-led TPS to practically price a larger number of heuristically generated itineraries (priced constrained to through-fares) in addition to those that would have otherwise been generated by the flight scheduling module."* [6]

Claim 41

Appellant's claim 41 is directed to an apparatus including a processor and a memory for executing the computer program product *"According to a further aspect of the present invention,*

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[3] Appellant's Specification., page 12, lines 5-11.
[4] *Id.*, page 17, line 23 – page 18, line 1.
[5] *Id.*, page 21, lines 12-18.
[6] *Id.*, page 19, lines 24-28.

*an apparatus includes a processor, a memory for executing a computer program product and a*

*computer readable medium storing the computer program product for producing itineraries..*"[7]

Appellant's claim 41 further includes a computer readable medium storing the computer

program product for producing itineraries: "*According to a further aspect of the present*

*invention, a computer program product residing on a computer readable medium for producing*

*itineraries includes....*" [8]

Inventive features of Appellant's claim 41 include instructions to receive trip segments:

"*A general process 50 for a flight scheduler 18 in the TPS 10 includes receiving 52 trip*

*segments.* " [9]  Inventive features further include instructions to determine constraints on

sequences of flights between the endpoints of the trip segments, "*the process 100 uses the*

*routing to generate 106 restrictions on individual flight and runs 107 the flight scheduler*

*incorporating flight restrictions to generate flight combinations that satisfy query time and*

*origin and destination constraints.* " [10]  The constraints are derived from fares between the end

points of the trip segments, which can be used with the flights: "*For example, a Los Angeles to*

*London (LAX-LON) fare may be given the global indicator AT, meaning "Atlantic", restricting*

*routes to travel over the Atlantic Ocean. ... the AT global indicator requires a flight across the*

*Atlantic ocean and prohibits flights across the Pacific ocean, thus ensuring for a LAX-LON fare*

*that one does not fly LAX-SYD-PAR-LON.* " [11]  Inventive features further include instructions to

generate itineraries of sequences of flights using the constraints to select which flights to include

in the sequences of flights of the generated itineraries, "*For each fare in F with unique routing*

*and endpoints, as per figure 2, the process generates 214 scheduler restrictions from fare,*

*augments 216 scheduler restrictions to allow for any necessary additional flights between*

*endpoints of fare and trip endpoints, such as flight from x to x' or from y' to y, and generates 218*

*itineraries using flight scheduler constrained by restrictions.* " [12] and instructions for causing a

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[7] Appellant's Specification., page 3, lines 4-7.
[8] *Id.*, page 2, lines 27-29.
[9] *Id.*, page 8, lines 4-5.
[10] *Id.*, page 12, lines 5-11.
[11] *Id.*, page 17, line 23 – page 18, line 1.
[12] *Id.*, page 21, lines 12-18.

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processor to price the itineraries *"This reduction may make it possible for an itinerary-led TPS to practically price a larger number of heuristically generated itineraries (priced constrained to through-fares) in addition to those that would have otherwise been generated by the flight scheduling module."* [13]

Claim 51

Appellant's claim 51 is directed to a computer program product residing on a computer readable medium for producing itineraries. Inventive features of Appellant's claim 51 include instructions for to receive trip segments: *"A general process 50 for a flight scheduler 18 in the TPS 10 includes receiving 52 trip segments."* [14] Inventive features of claim 51 also includes instructions to determine geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules: *"in general such fares only permit travel on the publishing airline;"* [15] *"Many fares contain a two-character identifier called the "global indicator" that restricts the general geographic route of a far;"* [16] and *"Most fares have many rules besides those that restrict flights. For example, it is typical for fares to restrict the dates and time of travel. Therefore not all fares are applicable for all travel queries. In the processes 50 and 100, it may be desirable to avoid considering those fares that clearly cannot be used for the query, so as to limit computation and avoid generating superfluous itineraries."* [17] Inventive features further include instructions to generate itineraries by using the constraints, *"For each fare in F with unique routing and endpoints, as per figure 2, the process generates 214 scheduler restrictions from fare, augments 216 scheduler restrictions to allow for any necessary additional flights between endpoints of fare and trip endpoints, such as flight from x to x' or from y' to y, and generates 218 itineraries using flight scheduler constrained by restrictions."* [18]

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[13] Appellant's Specification., page 19, lines 24-28.
[14] *Id.*, page 8, lines 4-5.
[15] *Id.*, page 17, lines 12-13.
[16] *Id.*, page 17, lines 21-23.
[17] *Id.*, page 18, lines 20-26.
[18] *Id.*, page 21, lines 12-18.

Claim 57

Appellant's claim 57 is directed to a computer implemented method for producing itineraries wherein the inventive features include receiving trip segments: *"a computer program product residing on a computer readable medium for producing itineraries includes instructions for causing a computer to receive trip segments,"* [19] determining geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules, *"...in general such fares only permit travel on the publishing airline;"* [20] *"Many fares contain a two-character identifier called the "global indicator" that restricts the general geographic route of a far;"* [21] and *"Most fares have many rules besides those that restrict flights. For example, it is typical for fares to restrict the dates and time of travel. Therefore not all fares are applicable for all travel queries. In the processes 50 and 100, it may be desirable to avoid considering those fares that clearly cannot be used for the query, so as to limit computation and avoid generating superfluous itineraries."* [22] and generating itineraries by using the constraints: *"For each fare in F with unique routing and endpoints, as per figure 2, the process generates 214 scheduler restrictions from fare, augments 216 scheduler restrictions to allow for any necessary additional flights between endpoints of fare and trip endpoints, such as flight from x to x' or from y' to y, and generates 218 itineraries using flight scheduler constrained by restrictions."* [23]

Claim 63

Appellant's claim 63 is directed to a computer program product residing on a computer readable medium for producing itineraries: *"According to a further aspect of the present*

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[19] Appellant's Specification., page 2, lines 27-30.
[20] Id., page 17, lines 12-13.
[21] Id., page 17, lines 21-23.
[22] Id., page 18, lines 20-26.
[23] Id., page 21, lines 12-18.

*invention, a computer program product residing on a computer readable medium for producing itineraries includes....*" [24]

Inventive features of Appellant's claim 21 include instructions to receive trip segments: "*A general process 50 for a flight scheduler 18 in the TPS 10 includes receiving 52 trip segments.*" [25] Inventive features further include instructions to determine constraints on sequences of flights between the endpoints of the trip segments, "*the process 100 uses the routing to generate 106 restrictions on individual flight and runs 107 the flight scheduler incorporating flight restrictions to generate flight combinations that satisfy query time and origin and destination constraints.*" [26] The constraints are derived from fares between the end points of the trip segments, which can be used with the flights: "*For example, a Los Angeles to London (LAX-LON) fare may be given the global indicator AT, meaning "Atlantic", restricting routes to travel over the Atlantic Ocean. ... the AT global indicator requires a flight across the Atlantic ocean and prohibits flights across the Pacific ocean, thus ensuring for a LAX-LON fare that one does not fly LAX-SYD-PAR-LON.*" [27]

Inventive features of Appellant's claim 63 further include instructions to generate itineraries of sequences of flights constrained by multiple constraints that are derived from a diverse set of fares in order to increase the diversity of generated itineraries using the multiple constraints to select which flights to include in the sequences of flights of the generated itineraries: "*The process 200 attempts to ensure airline/origin/destination diversity of the fares used to generate flight scheduler constraints by ranking constraints in such away that the first (cheapest) constraint from each airline/origin/destination is taken before the second from any. It also allows for control over the total number of itineraries produced heuristically, and the number produced for any particular constraint (fare routing). Many variations are possible, such as ones that prioritize constraints in other ways or that allow for other controls on the allocation of itineraries (such as allowing for per-airline limits) and resource consumption (such*

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[24] Appellant's Specification, page 2, lines 27-29.
[25] Id., page 8, lines 4-5.
[26] Id., page 12, lines 5-11.
[27] Id., page 17, line 23 – page 18, line 1.

*as allowing for limits on the total time spent generating itineraries using fare rule constraints)."*
[28]

Inventive features of Appellant's claim 63 also include instructions to return at least some of the generated itineraries to a user *"The process 200 removes 212 duplicates and returns itineraries."* [29]


## Claim 68

Appellant's claim 68 is directed to a computer implemented method for producing itineraries wherein the inventive features include receiving trip segments, *"a computer program product residing on a computer readable medium for producing itineraries includes instructions for causing a computer to receive trip segments,* [30]*"* and *"A general process 50 for a flight scheduler 18 in the TPS 10 includes receiving 52 trip segments;"* [31] determining constraints on sequences of flights, between the endpoints of the trip segments, which can be used with the flights: *"the process 100 uses the routing to generate 106 restrictions on individual flight and runs 107 the flight scheduler incorporating flight restrictions to generate flight combinations that satisfy query time and origin and destination constraints."* [32] The constraints are derived from fares between the end points of the trip segments, which can be used with the flights: *"For example, a Los Angeles to London (LAX-LON) fare may be given the global indicator AT, meaning "Atlantic", restricting routes to travel over the Atlantic Ocean. ... the AT global indicator requires a flight across the Atlantic ocean and prohibits flights across the Pacific ocean, thus ensuring for a LAX-LON fare that one does not fly LAX-SYD-PAR-LON."* [33] Inventive features also include generating itineraries of sequences of flights constrained by multiple constraints that are derived from a diverse set of fares in order to increase the diversity of generated itineraries using the multiple constraints to select which flights to include in the sequences of flights of the generated itineraries, *"The process 200 attempts to ensure*

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[28] Appellant's Specification., page 23, lines 2-14.
[29] *Id.*, page 23, lines 31-32.
[30] *Id.*, page 2, lines 27-30.
[31] *Id.*, page 8, lines 4-5.
[32] *Id.*, page 12, lines 5-11.
[33] *Id.*, page 17, line 23 – page 18, line 1.

*airline/origin/destination diversity of the fares used to generate flight scheduler constraints by*

*ranking constraints in such away that the first (cheapest) constraint from each*

*airline/origin/destination is taken before the second from any. It also allows for control over the*

*total number of itineraries produced heuristically, and the number produced for any particular*

*constraint (fare routing). Many variations are possible, such as ones that prioritize constraints*

*in other ways or that allow for other controls on the allocation of itineraries (such as allowing*

*for per-airline limits) and resource consumption (such as allowing for limits on the total time*

*spent generating itineraries using fare rule constraints)."* [34] and returning at least some of the

generated itineraries to a user: *"The process 200 removes 212 duplicates and returns*

*itineraries."* [35]


**(6)      Grounds of Rejection to be Reviewed on Appeal**

     1        Claims 57-62 and 68-76 stand rejected under 35 U.S.C. 101 as directed to non-
statutory subject matter.

     2.       Claims 21-50 and 63-76 stand rejected under 35 U.S.C. 112, second paragraph, as
being indefinite.

     3.       Claims 21-29, 32-47 and 50-76 stand rejected under 35 U.S.C. 102(b) as
anticipated by de Marcken (U.S. Patent No. 6,275,808).

     4.       Claims 30 and 48 stand rejected under 35 U.S.C. 103(a) as obvious over de
Marcken in view of Ratliff (US 2003/0191725).

     5.       Claim 31 and 49 stand rejected under 35 U.S.C. 103(a) as obvious over  de
Marcken in view of Travel Gazette.

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[34] Appellant's Specification, page 23, lines 2-14.
[35] *Id.*, page 23, lines 31-32.

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## (7)    Argument

### Non-statutory subject matter

As noted by the Examiner in the Final Office Action dated November 6, 2009, based on Supreme Court precedent and recent Federal Circuit decisions, a §101 process must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform the underlying subject matter (such as an article or materials) to a different state or thing. *Diamond v. Diehr*, 450 U.S. 175,209 USPQ 1 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gotschalk v. Benson*, 409 U.S. 63, 70, 71 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876). In addition, the tie to a particular apparatus, for example, cannot be mere extra-solution activity. *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

### Indefiniteness

It is not necessary for the claims to recite every element needed for practical utilization of the claimed subject matter in order for a claim to be proper under 35 U.S.C. §112, second paragraph, *Bendix Corp. v. United States*, 600 F.2d 1364, 1369, 204 U.S.P.Q. 617, 621 (Court of Claims, 1979). It is not the role of the claims to enable one skilled in the art to reproduce the invention, but rather to define the legal metes and bounds of the invention. *In re Geoffe*, 526 F.2d 1393, 1397, 188 U.S.P.Q. 131, (CCPA, 1975). The claims need not provide all operating details but a method claim should recite a positive step. *In re Erlich*, 3 U.S.P.Q. 2d 1011 (Bd. Pat. App. & Int., 1986).

### Anticipation

"It is well settled that anticipation under 35 U.S.C. §102 requires the presence in a single reference of all of the elements of a claimed invention." *Ex parte Chopra*, 229 U.S.P.Q. 230, 231 (BPA&I 1985) and cases cited.

"Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim." *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 198 (Fed. Cir. 1983).

"This court has repeatedly stated that the defense of lack of novelty (i.e., 'anticipation') can only be established by a single prior art reference which discloses each and every element of the claimed invention." *Structural Rubber Prod. Co. v. Park Rubber Co.*, 223 U.S.P.Q. 1264, 1270 (Fed. Cir. 1984), citing five prior Federal Circuit decisions since 1983 including *Connell*.

In a later analogous case the Court of Appeals for the Federal Circuit again applied this rule in reversing a denial of a motion for judgment n.o.v. after a jury finding that claims were anticipated. *Jamesbury Corp. v. Litton Industrial Prod., Inc.*, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

After quoting from *Connell*, "Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim," 225 U.S.P.Q. at 256, the court observed that the patentee accomplished a constant tight contact in a ball valve by a lip on the seal or ring which interferes with the placement of the ball. The lip protruded into the area where the ball will be placed and was thus deflected after the ball was assembled into the valve. Because of this constant pressure, the patented valve was described as providing a particularly good seal when regulating a low pressure stream. The court quoted with approval from a 1967 Court of Claims decision adopting the opinion of then Commissioner and later Judge Donald E. Lane:

> [T]he term "engaging the ball" recited in claims 7 and 8 means that the lip contacts the ball with sufficient force to provide a fluid tight seal **** The Saunders flange or lip only sealingly engages the ball 1 on the upstream side when the fluid pressure forces the lip against the ball and never sealingly engages the ball on the downstream side because there is no fluid pressure there to force the lip against the ball. The Saunders sealing ring provides a compression type of seal which depends upon the ball pressing into the material of the ring. *** The seal of Saunders depends primarily on the contact between the ball and the body of the sealing ring, and the flange or lip sealingly contacts the ball on the upstream side when the fluid pressure increases. 225 U.S.P.Q. at 258.

Relying on *Jamesbury*, the ITC said, "Anticipation requires looking at a reference, and comparing the disclosure of the reference with the claims of the patent in suit. A claimed device is anticipated if a single prior art reference discloses all the elements of the claimed invention as arranged in the claim." *In re Certain Floppy Disk Drives and Components Thereof*, 227 U.S.P.Q. 982, 985 (U.S. ITC 1985).

Obviousness

"It is well established that the burden is on the PTO to establish a prima facie showing of obviousness, *In re Fritsch*, 972 F.2d. 1260, 23 U.S.P.Q.2d 1780 (C.C.P.A., 1972)."

In *KSR Intl. Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), the Supreme Court reversed a decision by the Court of Appeal's for the Federal Circuit decision that reversed a summary judgment of obviousness on the ground that the district court had not adequately identified a motivation to combine two prior art references. The invention was a combination of a prior art repositionable gas pedal, with prior art electronic (rather than mechanical cable) gas pedal position sensing. The Court first rejected the "rigid" teaching suggestion motivation (TSM) requirement applied by the Federal Circuit, since the Court's obviousness decisions had all advocated a "flexible" and "functional" approach that cautioned against "granting a patent based on the combination of elements found in the prior art."

In *KSR* the Supreme Court even while stating that: "the Court of Appeals drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias," warned that: "a factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."

> The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U. S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary nor consistent with it.

With respect to the genesis of the TSM requirement, the Court noted that although "As is clear from cases such as Adams[36], a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can

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[36] United States v. Adams, 383 U. S. 39, 40 (1966)

be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known."

"The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

> Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Laskowski*, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

"The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).

> Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (emphasis in original, footnotes omitted).

"The critical inquiry is whether 'there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" *Fromson v. Advance Offset Plate, Inc.*, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).

### (1) Claims 57-62 and 68-76 are directed to statutory subject matter

Claims 57-62

For the purposes of this appeal only claims 57-62 stand or fall together. Claim 57 is representative of this group of claims.

Claim 57 is directed to a computer implemented method for producing itineraries. The method includes receiving trip segments by a computer and determining, by a computer, geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules. The method also includes generating itineraries using the constraints.

In rejecting Appellant's claims as directed to non-statutory subject matter, the examiner states:

> **The claims do recite a computer to perform some of the initial steps, however these steps only constitute insignificant pre-solution gathering activities. They do not serve to tie the entire process to a particular machine or place meaningful limits on what apparatus must be used to generate the solutions. And while the claimed invention is related to actual travel itineraries, no step is actually implemented to affect a physical transformation in the real world, only abstract determinations. As such, the claims concretely identify neither the particular apparatus performing the recited steps of the invention nor any transformation of underlying materials, and accordingly are directed to non-statutory subject matter.**

Appellant disagrees. The preamble of claim 57 recites "a computer-implemented method for producing itineraries." Claim 57 requires: "determining, by a computer, geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules." This feature is neither trivial nor insignificant pre-solution gathering activity. Rather, this feature involves significant and indeed sophisticated computer processing that is not merely information gathering,[37] and is a critical feature of the novelty of this claim over the cited art as will be discussed below.

The examiner seems to contend that generating itineraries using the constraints should have also been performed "by a computer." Generating the itineraries is described in the

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[37] Appellant's specification, page. 7, line 28 to page 12, line 25.

specification as performed by a computer. The examiner has not produced any authority for the proposition that all steps of a method claim must be tied to a machine. Moreover, because the method for producing the itineraries is recited to be "computer-implemented," the process, as a whole, is clearly tied to a computer.

Appellant contends that the subject matter of claim 57 and its dependent claims is clearly directed to statutory subject matter within the meaning of 35 U.S.C. 101, at least for the foregoing reasons.

Claims 68-76

For the purposes of this appeal only claims 68-76 stand or fall together. Claim 68 is representative of this group of claims.

Claim 68 recites the feature of: "determining, by a computer, constraints on sequences of flights, between the endpoints of the trip segments the constraints derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments." Appellant contends that the subject matter of claim 68 falls under statutory subject matter within the meaning of 35 U.S.C. 101, at least for analogous reasons discussed above with respect to claim 57.

**(2) Claims 21-50 and 63-76 distinctly claim the
subject matter of what Appellants consider to be
their invention**

Claims 21-40

For the purposes of this appeal only claims 21-40 stand or fall together. Claim 21 is representative of this group of claims.

The examiner rejects claims 21-40 under 35 U.S.C. second paragraph as failing to set forth subject matter which the Applicant regards as their invention.

With respect to claim 21, the Examiner states:

> Claim 21 recites "determine constraints on sequences of flights between
> the endpoints of the trip segments" and subsequently recites "generate
> itineraries of sequences of flights using the constraints to select which
> flights to include in the sequences of flights of the generated itineraries."
> This language is unclear. It seems as though the constraints are determined
> from sequences of flights, which themselves are subsequently determined
> from their constraints. The circular nature of these limitations makes the
> relationship between the recited elements unclear and does not properly
> apprise the public as to what would constitute infringement.

Appellant disagrees and contends that claim 21 distinctly points out the claimed
invention. The examiner misconstrues the claim and the recitation of the phrase "sequences of
flights" as it appears in two separate features of claim 21. The basis for the examiner's rejection
appears to be that the examiner considers the terms, as used, to be circular. The examiner
construes the first instance of "sequence of flights" as though the claimed feature of determining
constraints, derives the constraints from the sequences of flights themselves.

However, the first feature that uses the term "sequences of flights" clearly recites
determining constraints on sequences of flights. This feature does not derive the constraints
from the "sequences of flights."

In the second feature, the term "sequences of flights" are part of the itineraries generated
in the claim. The sequences of flights are generated based on the determined constraints, which
are used to select flights to include in the generated itineraries.

More specifically, the constraints are derived "... from fares between the end points of
the trip segments, which can be used with the flights to connect the end points of the trip
segments." For example, while there may be several valid routes for going from an origin to a
destination, all such valid routes may not actually be used due to constraints of a fare covering
that route.

To assist the Board and the examiner, the Appellants point to the following portion of the
Appellants' specification that provides an example of determining the constraints[38]:

> For each trip segment, for each non-duplicate routing, the
> process 100 uses the routing to generate 106 restrictions on
> individual flight and runs 107 the flight scheduler incorporating

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[38] Appellant's Specification, page 12, lines 5-25.

flight restrictions to generate flight combinations that satisfy query
time and origin and destination constraints and so forth. ... .

One way to re-express fare routings as restrictions on
individual flights is to translate the routing into a set of permitted
flight origin/destination/airline triples, so that only flights that
match these triples are considered by the scheduler. An advantage
to such a scheme is that while there may be many valid routes
permitted by a routing (exponential in the number of routing
nodes), there can only be a quadratic number of flight
origin/destination/airline triples (quadratic in the number of routing
nodes).

Appellants contend that the claims are not circular, and indeed when properly construed
to require instructions to determine constraints on sequences of flights from fares ... and
generate itineraries of sequences of flights using the determined constraints, clearly define the
subject matter to a person skilled in the art. Therefore, claim 21 distinctly points out the subject
matter of what Appellants consider as their invention.

With respect to claim 40, the examiner states:

> **Claim 40 recites the limitation "price the additional itineraries
> generated without considering the constraints and with considering the
> constraints" in lines 4-5. There is insufficient antecedent basis for this
> limitation in the claim. It is also unclear how the same itineraries could be
> generated by both considering and not considering the constraints. For
> examination purposes Examiner will consider this to refer to different
> itineraries; however the language should be clarified to reflect Applicant's
> intent.**

Appellants disagree. The phrases "additional itineraries" and "constraints" both have
antecedent bases recited in claim 40 and claim 21, respectively. The examiner misinterprets the
claim language in contending that "It is also unclear how the same itineraries could be generated by both
considering and not considering the constraints." Claim 40 recites *pricing* the additional itineraries
with and without considering the constraints. This refers to a faring process pricing the
generated itineraries both by using the constraints as well as not using the constraints. Appellant
contends that one of ordinary skill in the art, after reading claim 40, would clearly understand the
metes and bounds of claim 40.

### (3) Claims 21-29, 32-47 and 50-76 are not anticipated by de Marcken

Claims 21, 23-29, 32-41, 43-47 and 50

For the purposes of this appeal, claims 21, 23-29, 32-41, 43-47 and 50 stand or fall together. Claim 21 is representative of this group of claims. With respect to claim 21, the examiner states:

> As per claim 21, DeMarcken teaches a computer product to cause a computer to: receive trip segments (col. 4, lines 28-33); determine constraints on sequences of flights between the endpoints of the trip segments, the constraints derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments (col. 9, lines 20-30, 61-67); generate itineraries of sequences of flights using the constraints to select which flights to include in the sequences of flights of the generated itineraries (col. 10, lines 1-10, 25-40; col. 61, lines 56-62); and price the itineraries (col. 3, line 45; col. 11, lines 1-4).

Appellant contends that de Marcken neither describes nor suggests instructions to "determine constraints on sequences of flights between the endpoints of the trip segments, the constraints derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments," as recited in claim 21. Rather, de Marcken describes a faring process where an itinerary is decomposed into faring atoms or sequences of flights that are spanned by a single fare. As described by de Marcken [39]:

> The faring process 18 decomposes 82 the itinerary into faring atoms. As used herein, faring atoms refer to a sequence of flight segments or equivalently legs that are spanned by a single fare.

de Marcken does not describe or suggest determining any constraints on the sequences of flights, let alone the constraints being "derived from fares between the end points of the trip segments." In fact, no constraints can be derived on the faring atoms of de Marcken because, by definition, they are simply sequences of flights that are covered by a single fare. de Marcken

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[39] de Marcken , Col 9, lines 26-29.

further describes retrieving fares and rules for each faring atom and checking whether a fare can
be applied to a given faring atom. In other words, de Marcken describes checking whether a fare
can be used with a given sequence of flight that is part of an itinerary connecting two points.
This is clearly different from determining "constraints on sequences of flights … which can be
used … to connect the end points of the trip segments." Rather de Marcken describes
determining whether an available fare can be used for a given sequence of flight known to be a
part of an itinerary connecting the end point of the trip segments.

Further, de Marcken also neither describes nor renders obvious instructions to "generate
itineraries of sequences of flights using the constraints to select which flights to include in the
sequences of flights of the generated itineraries." The examiner relies on col. 10, lines 1-10 and
col. 10, lines 25-40 of de Marcken as allegedly teaching the foregoing feature. These portions of
de Marcken, however, describe the faring process that in turn is clearly described to operate on
itineraries that were previously provided from a scheduler process 16[40]:

> Referring now to FIGS. 4A and 4B, the faring process 18 includes a process
> 80 to retrieve itinerary sets for all slices in an itinerary. The itinerary sets are
> provided from the scheduler process 16 for each slice of a journey where a slice
> corresponds to a direction of travel (emphasis added).

The examiner also relies on col. 61, lines 56-62 as also allegedly disclosing the foregoing
feature of claim 21. The relevant portion of de Marcken describes a display window 390' that
depicts a set of pricing solutions. In particular, the cited portion describes how the window
depicts possible return itineraries that match a selected outbound itinerary. These teachings
neither describe nor render obvious instructions to: "generate itineraries of sequences of flights
using the constraints to select which flights to include in the sequences of flights of the generated
itineraries." Aside from the fact that de Marcken does not generate itineraries using constraints
derived from fares, as in the previous step, this passage from de Marcken deals with selecting
itineraries to pair with different segments of a trip (e.g., return and outbound itineraries), not
selecting flights to include in itineraries as recited in the claim.

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[40] de Marcken, Col. 9, lines 19-23.

Claims 22, 42, 52 and 58

For the purposes of this appeal, claims 22, 42, 52 and 58 stand or fall together. Claim 22 is representative of this group of claims.

The examiner cites col. 4, line 36 of de Marcken as allegedly disclosing the feature recited in claim 22. Appellant disagrees and contends that de Marcken fails to disclose or suggest "wherein the constraints are on flights." The constraints, as recited in claim 22, are used to generate itineraries of sequences of flights. de Marcken fails to suggest, much less describe, constraints "wherein the constraints are on flights," as recited in claim 22. The cited portion from de Marcken merely defines an itinerary as "sequences of flight segments between the origin and destination for each slice of a journey," and does not disclose any constraints "wherein the constraints are on flights," as recited in claim 22 or suggest to use such constraints to produce the itineraries mentioned in de Marcken.

Claims 51, 53-57 and 61-62

For the purposes of this appeal, claims 51, 53-57 and 61-62 stand or fall together. Claim 51 is representative of this group of claims. de Marcken fails to disclose or suggest "generate itineraries by using the constraints," as recited in claim 51. Claim 51 is therefore patentable for at least analogous reasons mentioned with reference to claim 21.

Further, Appellant contends that de Marcken fails to disclose or suggest that the constraints are "derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules." In contrast, the cited portions of de Marcken describe constructing priceable units from fare components. A priceable unit is a collection of fares and other information (e.g. discounts, penalties and surcharges) associated with the fares. A priceable unit is created from fare components[41] that are combinations of faring atoms and fares.[42] In other words, fare components are produced by testing a fare rule on a faring atom.[43] Constructing priceable units is unrelated to deriving the claimed constraints "from available fares

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[41] de Marcken, , col. 10, lines 25-26.
[42] _Id._, col. 10, lines 2-3.
[43] _Id._, col 10, lines 3-5.

to control the manner in which flights are combined *prior* to evaluation of fare rules," as required by claim 51.

Claims 63-76

For the purposes of this appeal, claims 63-76 stand or fall together. Claim 63 is representative of this group of claims.

Claim 63 recites, *inter alia*, "determine constraints on sequences of flights, between the endpoints of the trip segments the constraints derived from fares between the end points of the trip segments, which can be used with the flights; and generate itineraries of sequences of flights… ." Claim 63 is therefore patentable for at least analogous reasons mentioned with reference to claim 21.

Further, de Marcken also neither describes nor suggests, the feature of: "…sequences of flights constrained by multiple constraints that are derived from a diverse set of fares in order to increase the diversity of generated itineraries using the multiple constraints." Diversity is a characteristic of the selection of fares that are used for generating the constraints. Appellant's specification describes the advantages and methods of generating diverse itineraries by way of examples.[44] On the other hand, nothing in de Marcken even suggests considering multiple constraints derived from a diverse set of fares to increase diversity of generated itineraries. Therefore de Marcken does not describe a constraint, and thus can neither describe nor render obvious multiple constraints, "derived from a diverse set of fares in order to increase the diversity of generated itineraries," as recited in claim 63.

### (4) Claims 30 and 48 are not obvious over de Marcken and Ratliff

For the purposes of this appeal, claims 30 and 48 stand or fall together. Claim 30 is representative of this group of claims. The examiner relies on Ratliff for teaching "**global fare indicator; which is taught by Ratliff (Table 1)**." Appellants contend that assuming *arguendo* it is

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[44] Appellant's Specification, page 22, line 9 – page 23, line 14.

proper to combine de Marcken with Ratliff, the combination neither describes nor renders obvious the features of claim 30 at least for the reasons given for claim 21.

### (5) Claims 31 and 49 are not obvious over de Marcken and Travel Gazette

For the purposes of this appeal, claims 31 and 49 stand or fall together. Claim 31 is representative of this group of claims. The examiner relies on Travel Gazette for teaching " the constraints based on fare maximum permitted mileage;." Appellants contend that assuming *arguendo* it is proper to combine de Marcken with Travel Gazette, the combination neither describes nor renders obvious the features of claim 31 at least for the reasons given for claim 21.

### Conclusion

Appellant submits, therefore, that Claims 21-76 are directed to statutory subject matter, definite within the meaning of 35 U.S.C. 112, second paragraph and allowable over the cited art. Therefore, the Examiner erred in rejecting Appellant's claims and should be reversed.

Respectfully submitted,

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## Appendix of Claims

Claims 1-20 are withdrawn.


21.    A computer program product residing on a computer readable medium for producing itineraries comprises instructions for causing a computer to:

receive trip segments;

determine constraints on sequences of flights between the endpoints of the trip segments, the constraints derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments;

generate itineraries of sequences of flights using the constraints to select which flights to include in the sequences of flights of the generated itineraries; and

price the itineraries.


22.    The computer program product of claim 21 wherein the constraints are on flights.


23.    The computer program product of claim 21 wherein the constraints are on itineraries.


24.    The computer program product of claim 21 wherein the fares are fares between endpoints of trip segments.

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25.     The computer program product of claim 21 wherein the fares are fares between points connected by single flights to endpoints of trip segments.

26.     The computer program product of claim 21 wherein generating provides itineraries for a complete trip.

27.     The computer program product of claim 21 wherein generating provides itineraries separately for each trip segment.

28.     The computer program product of claim 21 wherein constraints are based on fare routings.

29.     The computer program product of claim 21 wherein constraints are based on fare carrier.

30.     The computer program product of claim 21 wherein constraints are based on fare global indicator.

31.     The computer program product of claim 21 wherein constraints are based on fare maximum permitted mileage.

32.     The computer program product of claim 21 wherein the constraints are

restrictions on individual flights used in itineraries.


33.     The computer program product of claim 21 wherein constraints are constraints on

airline and origin and destination triples.


34.     The computer program product of claim 21 wherein constraints are restrictions on

flight origin and destination.


35.     The computer program product of claim 21 further comprising instructions to:

choose constraints based on fare price.


36.     The computer program product of claim 21 further comprising instructions to:

generate additional itineraries from flights without considering the constraints.


37.     The computer program product of claim 21 wherein instructions to price, prices

the itineraries from flights by considering the constraints and wherein instructions to price

further comprises instructions to:

price additional itineraries generated without considering the constraints; and

return the additional priced itineraries.

38.     The computer program product of claim 21 wherein instructions to price further

comprises instructions to:

restrict pricing of itineraries based on the constraints used to produce the itineraries.


39.     The computer program product of claim 38 wherein instructions to price restricts

pricing restrictions on the endpoints of fares considered during pricing.


40.         The computer program product of claim 21 further comprises instructions

to:

generate additional itineraries from flights without considering the constraints;

price the additional itineraries from flights without considering the constraints and with

considering the constraints; and

return the priced additional itineraries.


41.     Apparatus comprising:

a processor;

a memory for executing a computer program product; and

a computer readable medium storing the computer program product for producing

itineraries comprises instructions for causing the processor to:

receive trip segments;

determine constraints on sequences of flights between the endpoints of the trip segments,

the constraints derived from fares between the end points of the trip segments, which can be used

with the flights;

generate itineraries of sequences of flights using the constraints to select which flights to

include in the sequences of flights of the generated itineraries; and

price the itineraries.

42.     The apparatus of claim 41 wherein the constraints are on flights.

43.     The apparatus of claim 41 wherein the constraints are on itineraries.

44.     The apparatus of claim 41 wherein the fares are fares between endpoints of trip

segments.

45.     The apparatus of claim 41 wherein the fares are fares between points connected

by single flights to endpoints of trip segments.

46.     The apparatus of claim 41 wherein constraints are based on fare routings.

47.     The apparatus of claim 41 wherein constraints are based on fare carrier.

48.     The apparatus of claim 41 wherein constraints are based on fare global indicator.


49.     The apparatus of claim 41 wherein constraints are based on fare maximum permitted mileage.


50.     The apparatus of claim 41 wherein constraints are constraints on airline and origin and destination triples.


51.     A computer program product residing on a computer readable medium for producing itineraries comprises instructions for causing a computer to:

receive trip segments;

determine geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules; and

generate itineraries by using the constraints.


52.     The computer program product of claim 51 wherein the constraints are on flights.


53.     The computer program product of claim 51 wherein the constraints are on itineraries.

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54.     The computer program product of claim 51 wherein constraints are based on fare routings.

55.     The computer program product of claim 51 wherein the constraints are restrictions on individual flights used in itineraries.

56.     The computer program product of claim 51 wherein constraints are constraints on airline and origin and destination triples.

57.     A computer-implemented method for producing itineraries comprising:

receiving, by a computer, trip segments;

determining, by a computer, geographic and airline constraints derived from available fares to control the manner in which flights are combined prior to evaluation of fare rules; and

generating itineraries by using the constraints.

58.     The method of claim 57 wherein the constraints are on flights.

59.     The method of claim 57 wherein the constraints are on itineraries.

60.     The method of claim 57 wherein constraints are based on fare routings.

61. The method of claim 57 wherein the constraints are restrictions on individual flights used in itineraries.

62. The method of claim 57 wherein constraints are constraints on airline and origin and destination triples.

63. A computer program product residing on a computer readable medium for producing itineraries comprises instructions for causing a computer to:

receive trip segments;

determine constraints on sequences of flights, between the endpoints of the trip segments the constraints derived from fares between the end points of the trip segments, which can be used with the flights; and

generate itineraries of sequences of flights constrained by multiple constraints that are derived from a diverse set of fares in order to increase the diversity of generated itineraries using the multiple constraints to select which flights to include in the sequences of flights of the generated itineraries; and

return at least some of the generated itineraries to a user.

64. The computer program product of claim 63 wherein the fares are chosen to include multiple airlines.

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65.     The computer program product of claim 63 wherein the fares are chosen to include multiple origins.


66.     The computer program product of claim 63 wherein the fares are chosen to include multiple destinations.


67.     The computer program product of claim 63 wherein the fares are chosen to include multiple origin-destination pairs.


68.     A computer-implemented method for producing itineraries comprising:

receiving, by a computer, trip segments;

determining, by a computer, constraints on sequences of flights, between the endpoints of the trip segments the constraints derived from fares between the end points of the trip segments, which can be used with the flights to connect the end points of the trip segments; and

generating itineraries of sequences of flights constrained by multiple constraints that are derived from a diverse set of fares in order to increase the diversity of generated itineraries using the multiple constraints to select which flights to include in the sequences of flights of the generated itineraries; and

returning at least some of the generated itineraries to a user.


69.     The method of claim 68 wherein the fares are chosen to include multiple airlines.

70.    The method of claim 68 wherein the fares are chosen to include multiple origins.

71.    The method of claim 68 wherein the fares are chosen to include multiple destinations.

72.    The method of claim 68 wherein the fares are chosen to include multiple origin-destination pairs.

73.    The method of claim 68 where fares are filtered based on properties of the fare rules.

74.    The method of claim 73 where fares fail if aspects of the fare's rules are violated.

75.    The method of claim 74 where the aspects are the fare's effective and discontinue dates.

76.    The method of claim 74 where the aspects are the fare's rules that limit at least one of travel dates and travel times.

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## Evidence Appendix

None

## Related Proceedings Appendix

None